

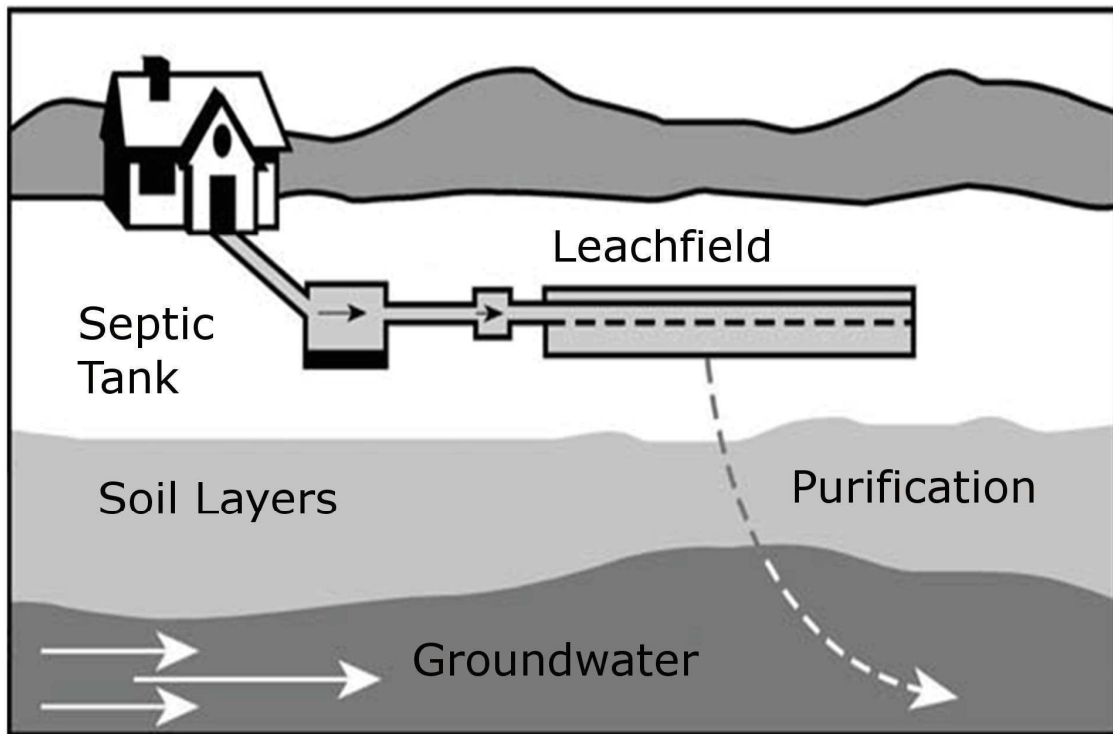


WYOMING
WATER QUALITY DIVISION

CONVENTIONAL SEPTIC SYSTEMS

APPLICATION PACKAGE FOR

PERMIT TO CONSTRUCT



Source: NSFS, 2000

Wyoming Water Quality Rules and Regulations, Chapter 25

December 2015

Introduction

The following package is to assist you in submitting a completed application for a properly designed small wastewater treatment and disposal system. It is designed **only** for a conventional system (septic tank and leachfield) with a wastewater flow of less than 2,000 gallons per day. It has been prepared under the direction of James Brough, P.E. # 10414, a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. A signed and sealed copy is maintained on file at the Lander offices of DEQ.

Using the information in this design package and accurately completing the necessary forms for the chosen system should ensure that the design will comply with the minimum requirements of the Wyoming Water Quality Rules and Regulations, Chapter 25.

This package is for a standard trench or bed type disposal system, using either pipe or chambers. If the seasonal high groundwater, bedrock, or impervious clay layer is within four feet of the bottom of the proposed leachfield, then a mounded, partially mounded, non-discharging pond, or evapotranspiration system may be required. Since these types of facilities are more difficult to design and construct, **this package does NOT provide guidance in the design of non-conventional disposal systems. Please contact your district engineer if you propose to use a non-conventional system.**

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Wyoming Water Quality Application Form Permit to Construct Small Wastewater System Conventional Septic System with Leachfield less than 2,000 gallons per day only. Not to be used for mound, evaporation ponds, or other non-conventional systems. For non-conventional system, contact district engineer. For systems exceeding 2,000 gallons per day, contact the Underground Injection Control Program at 307-777-7781 or refer to: http://deq.wyoming.gov/wqd/underground-injection-control/				WQD USE ONLY	
				App. No	
				Date	
Complete attached package and submit to appropriate office:					
DEQ/ Water Quality Division 200 W. 17th St.- 4th Floor Cheyenne, WY 82002 (307) 777-7781		DEQ/Water Quality Division 510 Meadowview Drive Lander, WY (307) 332-3144		DEQ/Water Quality Division 152 North Durbin Street, Suite 100 Casper, WY 82601 (307) 473-3465	
Please see: https://gis.deq.wyoming.gov/maps/www_districts/index.html to locate nearest office.					
Name of Project:					
Description of Project:					
Location:	County:				
	¼ ¼ Section		Section		
	Township		Range		
	Subdivision Name				
	Lot and Block				
Signatures: All undersigned agree to comply with the applicable Wyoming Statutes and Regulations and to allow the activities described in this application.					
Real Estate Owner			Engineer/Geologist (required for all commercial systems)		
Sign Above			Sign Above		
Printed Name:			Printed Name:		
Title:			Title:		
Mailing Address			Mailing Address		
City, State			City, State		
Zip			Zip		
Phone Number			Phone Number		
Email			Email		
			WY P.E.#		WY P.G.#

PROPERTY INFORMATION AND INSTALLER

PROPERTY	County		
	Physical Address		
	Size	feet by feet OR	acres
	Type of Building		
		(single family dwelling, mobile home, commercial, etc.)	
Water Source Check one	<input type="checkbox"/> Private well SEO Well Number _____ <input type="checkbox"/> Cistern <input type="checkbox"/> Community Well _____ (name) <input type="checkbox"/> Municipal _____ (name)		
Is the septic system in compliance with a county approved plat? ____ Yes ____ No Attach the legal description of property (from Sales Contract or Deed)			
Is this a replacement septic tank and/or leachfield? ____ Yes ____ No			
INSTALLER	Name		
	Mailing Address		
	City, State		
	Phone		
	Email		
Additional comments:			

Attach copy of legal description

SYSTEM DESIGN AND CONFIGURATION

PLEASE CHECK ONE	<input type="checkbox"/> Permanent Structure (single family residence)	_____ number of bedrooms x 150 gallons per day per bedroom = _____ gallons per day				
	<input type="checkbox"/> Mobile Home (check one)	<input type="checkbox"/> 1 or 2 bedrooms = 350 gallons per day <input type="checkbox"/> 3 bedrooms = 500 gallons per day <input type="checkbox"/> 4 bedrooms = 650 gallons per day				
	<input type="checkbox"/> Non-residential	Refer to Chapter 25, Table 1 (show calculations – use another sheet if needed)				
DESIGN FLOW gpd		Box 1				
PERCOLATION RATE mpi		(from above)				
PERCOLATION RATE mpi		(from percolation test results – Page 8)				
PLEASE CHECK ONE	Perc. Rate	Loading Rate	Perc. Rate	Loading Rate	Perc. Rate	Loading Rate
	○ 1 - 5	0.80	○ 16	0.50	○ 30-31	0.39
	○ 6	0.75	○ 17	0.49	○ 32-33	0.38
	○ 7	0.71	○ 18	0.48	○ 34- 35	0.37
	○ 8	0.68	○ 19	0.47	○ 36- 38	0.36
	○ 9	0.65	○ 20	0.46	○ 39 - 41	0.35
	○ 10	0.63	○ 21	0.45	○ 42- 44	0.34
	○ 11	0.60	○ 22 - 23	0.44	○ 45 - 47	0.33
	○ 12	0.57	○ 24	0.43	○ 48 - 52	0.32
	○ 13	0.55	○ 25	0.42	○ 53 - 56	0.31
	○ 14	0.54	○ 26 - 27	0.41	○ 57 - 60	0.30
	○ 15	0.52	○ 28 - 29	0.40		
LOADING RATE gpd/ft ²		Box 2				
LEACHFIELD SIZING sq. ft.		Design flow (green box 1) / Loading rate (red box 2) _____ / _____ =				
LEACHFIELD SIZING sq. ft.		Box 3				
LEACHFIELD SIZING sq. ft.		(from above)				

Percolation Tests

In order for a septic system to perform properly, the wastewater needs to be effectively treated by the soil and percolate or travel through the soil in a reasonable amount of time to be appropriately treated.

PERCOLATION TEST PROCEDURE INSTRUCTIONS

1. Location of Percolation Test Holes - The percolation (perc) test holes shall be spaced uniformly over the proposed soil absorption (leachfield) site. A **minimum of three (3) test holes** are required. More than 3 can be used if desired.

2. Test Hole Preparation - Test holes that are **4 to 12 inches** in diameter shall be dug or bored to the proposed depth of the leach field (typical depths are **30 to 40 inches**). The side walls shall be vertical and a natural soil surface (one which is not smeared from digging) shall be exposed by scraping the sides and bottom of the test hole with a sharp pointed instrument. Any loose material shall be removed from the test hole and several inches of course sand or gravel placed in the bottom of the test hole in order to prevent scouring and sealing before the water is poured in.

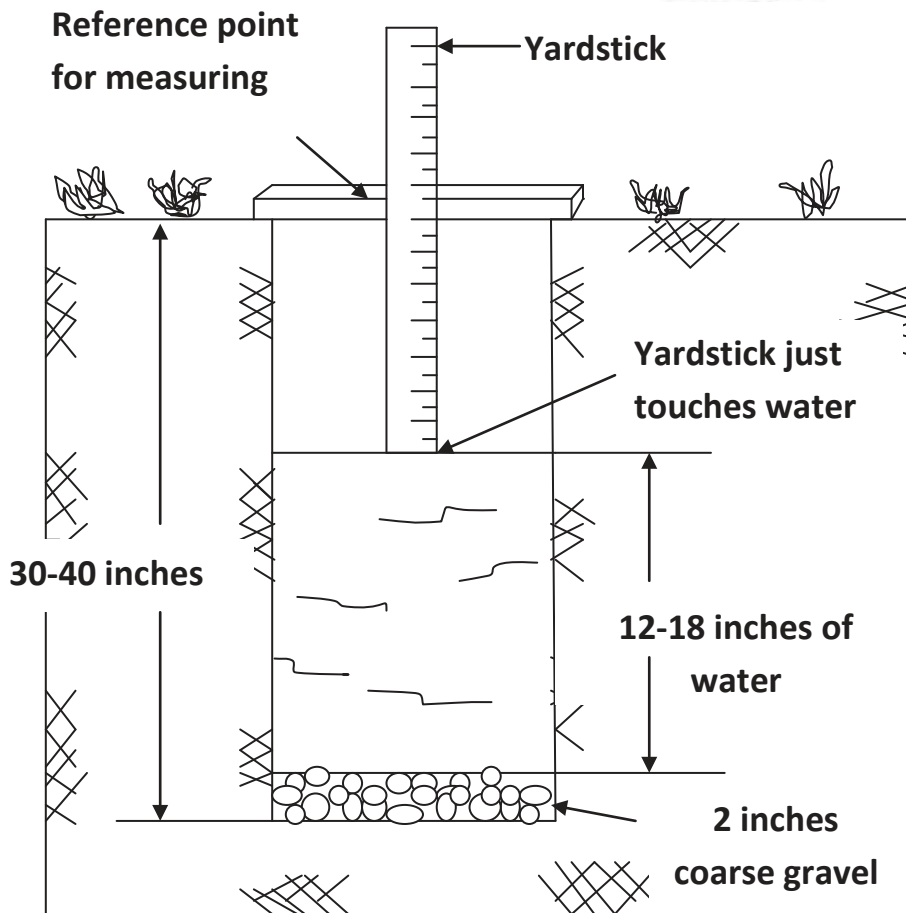
3. Presoaking - **PRESOAKING IS ABSOLUTELY REQUIRED** in order to get valid percolation test results. The purpose of presoaking is to have the water conditions in the soil reach a stable condition similar to that which exists during continual wastewater application in a leachfield. The minimum time of presoaking varies with soil type and presoaking instructions are usually sufficient to establish the proper soil moisture conditions.

a. *Sandy or loose soils* - Fill the test hole to within several inches of the top and allow it to seep away. Fill the hole a 2nd and 3rd time and let the water seep away. If the water continues to all seep away in ten (10) minutes or less, this indicates that the soil is excessively permeable and the site is unsuitable for a standard subsurface disposal system. In this case, special requirements are needed and you'll need to contact your County Official.

b. *Other suitable soils* - If the soil is suitable for a standard subsurface leachfield, then the test holes should be presoaked for at least 4 hours. Maintain at least 12 inches of water in the test holes for at least 4 hours, then allow the soil to swell for 12 hours (overnight is good) before starting the actual perc test measurements.

4. Percolation Rate Measurements - Start the test by filling each test hole with approximately **12 to 18 inches** of water. Let the soil re-hydrate for about 15 minutes and then refill to 12 to 18 inches deep. Next, decide on a time interval for your test. Time intervals of **10 or 15 minutes** are typical. Once decided, the time interval must remain constant throughout the test so that it can be determined when the water level drop rate has stabilized. Measure the initial water level (from a fixed reference point such as a flat board across the top of the hole) in each hole and record on the first line for each hole in the test data table. After each water level measurement, calculate the water level drop from the previous measurement and record in the test data table. Continue the test until the water

level drop rate has stabilized; i.e. - **3 consecutive equal drop rates** within 1/8 inch of each other. Please note that some test holes may take longer than others to stabilize. The test should be continued at each test hole until each drop rate stabilizes. Also please note, a minimum of **6 inches** of water should be maintained in the test hole. If the level drops below 6 inches, some additional water should be added between time intervals. If water level drops fluctuate, use the final of 6 intervals for calculations.



Side view of a typical percolation test. Yardstick is lowered to the surface of the water after each time interval. Time interval and measurement are noted and recorded. When measuring use the reference point as a guide.

PERCOLATION TEST DATA

Performed by: _____ Test Date: _____

INTERVAL: The water levels were measured every ____ minutes.

Holes were pre-soaked for _____ (time).

[illegible]

Time Interval						
Final Drop						
Perc Rate						

To calculate perc rate:

Perc Rate (minutes per inch): **Time Interval (minutes) / Final Drop (in inches)**

Example: 10min. divided by $2 \frac{1}{8}" = 10/2.125 = 4.70$ minutes/one inch of drop

HELPFUL CONVERSIONS:

$$1/8 = .125, 1/4 = .25, 3/8 = .375, 1/2 = .5, 5/8 = .625, 3/4 = .75, 7/8 = .875$$

ABSORPTION SYSTEM DESIGN PERCOLATION RATE: If 3-5 holes were tested, use the slowest (highest number) rate from all of the holes tested. If 6 or more were tested, use the average rate.

SITE SUITABILITY

The owner must be aware of the depth of the impermeable soil layer, the seasonally high groundwater level, and slope when considering the septic system location.

Please check off the following and complete as indicated:

Excavation	Was an excavation conducted within the proposed location of the leachfield?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Was bottom of the excavation at least 4 feet below the bottom of the proposed leachfield?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Was a color photograph taken of the excavation, showing a tape measure? If so, please submit photograph with application.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Depth of Excavation?		
	Who conducted the excavation?		
	Date excavation was conducted?		
Impermeable Layer	Was a rock layer observed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If yes, at what depth below ground surface?		
	Was a clay layer observed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If yes, at what depth below ground surface?		
Seasonal High Groundwater	Was groundwater present in the excavation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If so, at what depth below ground surface?		
	Did the soil have a mottled color (which can be indicative of groundwater)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If so, at what depth below ground surface?		
	Was the soil stained a dark color or was a salt/alkali layer encountered?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If so, at what depth below ground surface?		
Slope	What is the estimated slope of the proposed leachfield area?		
	How far away is the nearest break in slope (such as the side of a hill)?		
	How far away is the nearest drainage ditch or surface water body, such as a river, pond, creek, etc.?		
	Was a color photograph taken of the proposed leachfield area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

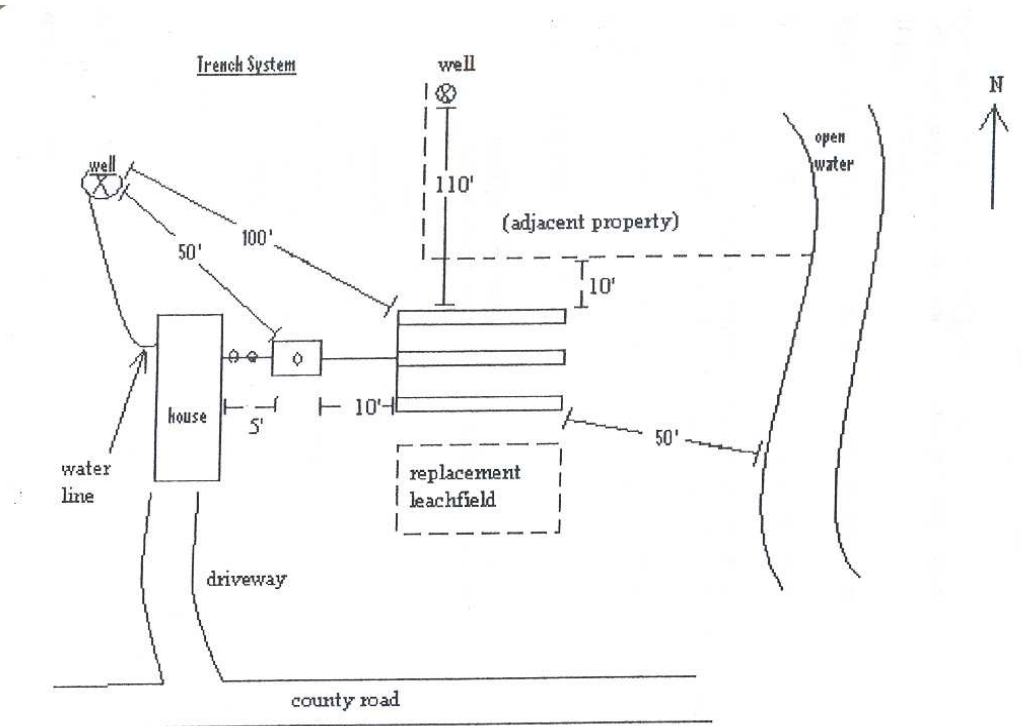
Attach a color photograph of the excavation and proposed location of the leachfield.

SITE PLAN DRAWING

Provide a sketch of your site, showing the following (check off those items included on your site plan):

<input type="checkbox"/>	Property lines	<input type="checkbox"/>	Leachfield
<input type="checkbox"/>	All buildings	<input type="checkbox"/>	Replacement leachfield
<input type="checkbox"/>	Surface water (ditch, creek, pond, etc.)	<input type="checkbox"/>	Slope of land (drawn as an arrow indicating general slope direction)
<input type="checkbox"/>	Water lines	<input type="checkbox"/>	North arrow
<input type="checkbox"/>	All wells within 200 feet	<input type="checkbox"/>	Access road to house or driveway
<input type="checkbox"/>	Septic tank		

Example site plan:



Your septic system MUST have the following minimum separation distances:

From	To Septic Tank	To Leachfield
<input type="checkbox"/> Wells	50 feet	100 feet
<input type="checkbox"/> Open waterways	50 feet	50 feet
<input type="checkbox"/> Potable water lines	25 feet	25 feet
<input type="checkbox"/> Building foundation without foundation drain	5 feet	10 feet
<input type="checkbox"/> Building foundation with a foundation drain	5 feet	25 feet
<input type="checkbox"/> Break in slope	15 feet	15 feet
<input type="checkbox"/> Property line	10 feet	10 feet
<input type="checkbox"/> Septic tank	Not applicable	10 feet

Attach a site plan.

COMPONENTS

SEPTIC TANK	Is the septic tank on the approved list?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If yes, provide the following:	Manufacturer:		
		Model:		
		Size:		
	If no, provide the following AND Complete septic tank design worksheet:	Size of tank		
		Number of compartments		
		Tank material		
	For a 4-bedroom (or smaller) house, is the tank size 1,000 gallons or more?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	For homes greater than 4 bedrooms, does the tank have additional capacity of 250 gallons per additional bedroom?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Estimated depth of backfill over tank?			
	Is the tank equipped with a 6-inch cleanout that extends to the ground surface from each compartment of the tank?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
PIPING	What is the piping material from the house to the septic tank?			
	What is the pipe size?			
	Is the pipe from the house to the septic tank in a straight line?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If no, will cleanout ports be installed at any alignment change greater than 22.5 degrees? This is required.		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Is the pipe from the house to the septic tank greater than 100 feet?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	If yes, will cleanout ports be installed? This is required.		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Is there a cleanout port just outside of the building? (encouraged, not required)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Does the piping have a minimum slope of ¼ inch per foot (2%) for a 4-inch pipe?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Is there a distribution box on the effluent piping?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Are flow dividers installed on the effluent piping?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Are all leachfield trenches less than 100 feet? This is required.		<input type="checkbox"/> Yes	<input type="checkbox"/> No
LEACHFIELD DESIGN	Are you using a pipe trench system? IMPORTANT: Complete Part A		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Are you using a pipe bed system? IMPORTANT: Complete Part B		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Are you using a chamber trench system? IMPORTANT: Complete Part C		<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Are you using a chamber bed system? IMPORTANT: Complete Part D		<input type="checkbox"/> Yes	<input type="checkbox"/> No

SEPTIC TANK DESIGN WORKSHEET

(To be completed ONLY if tank is not on approved list)

Material: _____

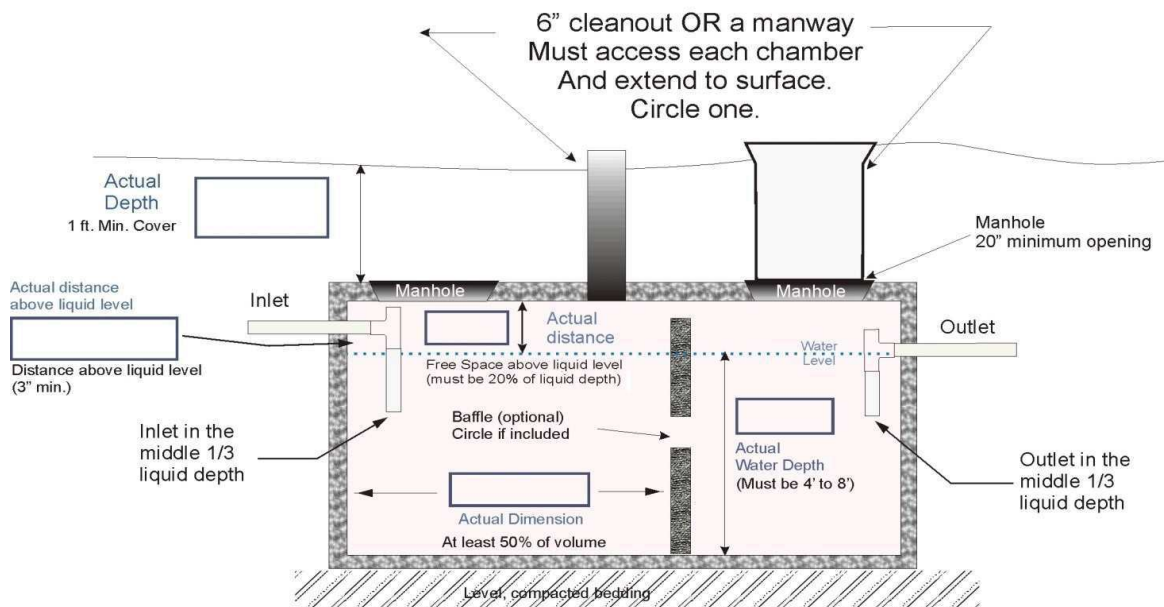
Inside Dimensions (in inches) _____

Length _____ Width _____ Height _____

Liquid Depth _____ Air Space _____

Operating Capacity = (Length * Width * Liquid Depth) / 231 = _____ Gallons

Fill in all blue boxes below.



All requirements listed below and shown on the illustration apply to any tank used or site-built:

1. All small wastewater systems using a septic tank must have a minimum operating capacity of 1,000 gallons. Additional capacity of 250 gallons per bedroom is required for each bedroom past four. Either one or two tanks may be used to meet this requirement.
2. The septic tank must be constructed of durable material not subject to rapid corrosion or decay and must be structurally sound and watertight. Steel tanks are not allowed.
3. Single compartment tanks shall have a minimum length to width ratio of 2:1.
4. Two compartment tanks shall have at least 50% of the volume in the first compartment.
5. Each compartment of the tank shall have an access opening with a minimum dimension of 20 inches in the least direction. Both inlet and outlet devices shall be accessible.
6. Clean-outs extending from each compartment to the surface with a minimum diameter of 6 inches must be provided. The access openings may be extended to the ground surface by use of a manway in lieu of a clean-out riser. All openings must be capped.